

**TECHNICAL REVIEW DOCUMENT
For
RENEWAL OF OPERATING PERMIT 02OPLI253**

Tri-State Generation and Transmission Association, Inc.
Limon Generating Station
Lincoln County
Source ID 0730036

Prepared by Blue Parish
July & December, 2009

Updated February 2, 2010 based on comments received during public comment
Revised May 2009 to address Excess Emission Reporting Frequency

I. Purpose:

This document establishes the basis for decisions made regarding the applicable requirements, emission factors, monitoring plan and compliance status of emission units covered by the renewed Operating Permit for the Tri-State Generation and Transmission Association, Inc. (Tri-State) Limon Generating Station. The current Operating Permit for this facility was issued on April 1, 2004, was last revised on June 18, 2004 and expired on April 1, 2009. However, since a timely and complete renewal application was submitted, under Colorado Regulation No. 3, Part C, Section IV.C all of the terms and conditions of the existing permit shall not expire until the renewal operating permit is issued and any previously extended permit shield continues in full force and operation.

This document is designed for reference during review of the proposed permit by EPA and for future reference by the Division to aid in any additional permit modifications at this facility. The conclusions made in this report are based on the source's renewal application submitted on March 11, 2008, the Acid Rain Permit Renewal Application received on August 25, 2009, comments related to the combined review of the Limon Station draft and the Frank Knutson Station Draft received on October 19, 2009, December 4, 2009 and December 16 & 18, 2009, comments received from the source during the public comment period on January 20, 2010, previous inspection reports and various email correspondence, as well as telephone conversations with the applicant. Please note that copies of the Technical Review Document for the original permit and any Technical Review Documents associated with subsequent modifications of the original Operating Permit may be found in the Division files as well as on the Division website at <http://www.cdphe.state.co.us/ap/Titlev.html>. This narrative is intended only as an adjunct for the reviewer and has no legal standing.

Any revisions made to the underlying construction permits associated with this facility made in conjunction with the processing of this operating permit application have been reviewed in accordance with the requirements of Regulation No. 3, Part B, Construction Permits, and have been found to meet all applicable substantive and procedural

requirements. This operating permit incorporates and shall be considered to be a combined construction/operating permit for any such revision, and the permittee shall be allowed to operate under the revised conditions upon issuance of this operating permit without applying for a revision to this permit or for an additional or revised construction permit.

II. Description of Source

This facility consists of two natural gas-fired simple cycle combustion turbines used to generate electric power and is defined under Standard Industrial Classification 4911. The combustion turbines are primarily fueled by natural gas and are designed to burn distillate fuel oil as a back-up fuel sources. Each turbine is equipped with dry low NO_x combustion systems to reduce NO_x emissions. Water injection is used to reduce NO_x emissions when burning distillate fuel oil. Each combustion turbine generates approximately 82 MW of power.

The facility is located at 48303 State Highway 71 (approximately 7 kilometers south, southwest of Limon on the west side of State Highway 71). There are no Federal Class I designated areas within 100 kilometers and no affected states within 50 miles of this facility.

This facility is located in an area designated attainment for all pollutants. It is categorized as a major stationary source (Potential to Emit \geq 250 Tons/Year for NO_x and CO. Future modifications at this facility resulting in a significant net emissions increase (see Reg 3, Part D, Sections II.A.26 and 42) for any pollutant as listed in Regulation No. 3, Part D, Section II.A.42 or a modification which is major by itself (i.e. a Potential to Emit of \geq 250 TPY of any pollutant listed in Regulation No. 3, Part D, Section II.A.42) may result in the application of the PSD review requirements.

Emissions (in tons/yr) at the facility are as follows:

Pollutant	Potential to Emit (tpy)	Actual Emissions (tpy)
PM	115.6	4.3
PM10	115.6	4.3
SO ₂	49.2	0.8
NO _x	370.4	21.9
VOC	13.4	0.2
CO	396.4	18.6
HAP	6	Not reported

Potential emissions are based on permitted emission limits. HAP potential to emit is based on both turbines burning natural gas only, AP-42 (Section 3.1, Table 3.1-3, dated April 2000) emission factors for formaldehyde, xylene and acetaldehyde (3 highest HAP emission factors) and the permitted heat input rate. Actual emissions are based on APENs submitted for data year 2007.

Applicable Requirements

Combustion Turbine MACT (40 CFR Part 63 Subpart YYYYY)

Since the original permit issuance, Subpart YYYYY was published in the Federal Register (March 2004). Subpart YYYYY applies to major sources of Hazardous Air Pollutants (HAPs). The facility is not a major source of HAP emissions, so MACT YYYYY does not apply.

Standards of Performance for Stationary Gas Turbines (40 CFR Part 60 Subpart GG)

The turbines are subject to the Standards of Performance for Stationary Gas Turbines of Subpart GG.

Compliance Assurance Monitoring (CAM) Requirements (40 CFR Part 64)

CAM requirements apply to the turbines when distillate oil is used as fuel, as determined during initial issuance of the Operating Permit.

III. Discussion of Modifications Made

Source Requested Modifications

The renewal application received on March 11, 2008 requested the following modifications:

- Update the Responsible Official and Facility Contact Person,
- Update regulatory citations due to changes to Colorado Regulation No. 3,
- Add a diluent cap for carbon monoxide continuous emission monitoring system (CEMs) data conversions,
- Change the frequency of opacity readings during fuel oil startup from semiannually to annually,
- Update the Acid Rain Designated Representative information,
- Remove the requirement for annual Acid Rain Program reports as this requirement expired in 2005,
- Update regulatory citations due to changes to 40 CFR 60, Subpart GG,
- Update the Insignificant Activities List, and
- Clarify the Fuel Heating Value Sampling language in Appendix G to correct errors and to more accurately reflect the requirements for fuel oil sampling that apply as per 40 CFR Part 75, Appendix D.

The source's requested modifications were addressed as follows:

Page following cover page

- Revised the responsible official and permit contact information in accordance with information submitted in the renewal application

Section I – General Activities and Summary

- Updated Condition 3.1 (status of source with respect to PSD requirements) to reflect Division's current standard language and current Regulation No. 3 citations.
- During review of the draft permit, Tri-State requested that an Alternative Operating Scenario (AOS) addressing the replacement of turbines and turbine components be included in the renewal permit. Note that Tri-State requested changes in the Division's standard AOS language for the Frank Knutson Station renewal permit (0011349, OP#03OPAD257), and these changes were also requested for Limon Station.

The Division's standard turbine AOS language currently reads:

"The following physical or operational changes to the turbines in this permit are not considered a modification for purposes of NSPS GG, NSR/PSD, or Regulation No. 3:

- 1) Replacement of stator blades, turbine nozzles, turbine buckets, fuel nozzles, combustion chambers, seals, and shaft packings, provided that they are of the same design as the original."

Tri-State requested that the listing of routine turbine component replacements be changed to:

"Replacement of compressor stator and rotating blades, turbine nozzles, turbine buckets, turbine shroud block, fuel nozzles, combustion chamber system, seals, and shaft packings, provided that they are of the same design as the original."

Tri-State explained in their request that the change in language adds greater detail to the description of the turbine and compressor. Routine maintenance and inspections are completed at scheduled intervals, and these parts are replaced due to wear and/or fatigue or as per manufacturer's recommendations. Tri-State also explained that these parts are replaced with "like kind" parts, do not increase the output of the turbine, and that even the cost of a major overhaul would not constitute a reconstruction under the NSPS definition (greater than 50% of the cost of a new turbine). The Division is including the requested changes in the renewal permit.

Section II – Specific Permit Terms

- Condition 1.6 addresses CO emission limits and the use of a Continuous Emission Monitoring System (CEMS) to monitor compliance with those limits. Condition 2.1.1.2 includes CEMS equipment and quality assurance/quality control requirements, which refer to the requirements of 40 CFR 75 for data conversions

with respect to NOx monitoring. Section 3.3.4.1 of Appendix F allows the use of a maximum oxygen content of 19% in the conversion of CEMS measurements when the measured oxygen concentration is above 19.0%. Although the diluent cap for NOx monitoring is included in both 40 CFR 75 and NSPS Subpart GG, it is not included for CO monitoring as there are no CO emission standards in the Part 75 or Subpart GG regulations. The renewal application requests that the same diluent cap for NOx CEMS data conversions be made available for CO CEMS data conversions. The Division concurs and has included the language as new Condition 1.6.3.

- Condition 1.12.5.1 requires visible emission observations using EPA Method 9 be taken semi-annually when distillate fuel oil is combusted and one of the activities listed under Colorado Regulation No. 1, Section II.A.4 occurs (the building of a new fire, cleaning of fire boxes, soot blowing, start-up, process modifications, or adjustment or occasional cleaning of control equipment). The renewal application states that the condition applies during turbine startup, and that opacity observations have never been observed while turbine startup occurs on distillate fuel oil. The application requests that the frequency of the condition be changed from semi-annually to annually. The Division concurs and the language has been updated.
- The last sentence of Condition 1.14 was removed as this related to annual Acid Rain compliance certifications that only applied for calendar years 1995 – 2005.
- Tri-state requested in a December 18, 2009 email that the definition of “start-up” with respect to opacity requirements be clarified in the permit. Condition 1.12.3 includes a 30% opacity limit (Colorado Regulation No. 1, Section II.A.4) during certain activities, including startup. Condition 1.12.1 includes a 20% opacity limit (Colorado Regulation No. 6, Part B, Section II.C.3) that applies at all times except during startup and shutdown. The definitions of startup and shutdown applicable to these limits are found in the Common Provisions Regulation: “Startup” means any setting in operation of an air pollutant source for any purpose, and “shutdown” means the cessation of operation of an air pollutant source for any purpose. These definitions have been added into Condition 1.12.3 and 1.12.1.

Section III – Acid Rain Requirements

- Revised the information on the designated representative (DR) and alternate designated representative (ADR).
- Removed the requirement to submit the annual compliance certification in Section 4 (Reporting Requirements). As a result of revisions to the Acid Rain Program made with the Clean Air Interstate Rule (final published in the federal register on May 12, 2005), annual compliance certifications are no longer required, beginning in 2006.

Section IV – Permit Shield

- Corrected citations in the list of streamlined conditions to reflect revisions to 40 CFR Part 60 Subpart GG. Note that the NOx emission limits in Subpart GG were previously 100 ppmvd for natural gas and 96 ppmvd for distillate fuel oil, and these limits were streamlined out as the BACT limits were more stringent. The current version of Subpart GG includes NOx emission limits that are calculated from an equation based on the manufacturer's rated heat rate and an allowance for fuel-bound nitrogen. The lowest possible NOx emission rate that can be calculated from the equation is higher than the BACT limit, therefore the NOx GG limits remain streamlined out of the permit.

Appendices

- Appendix G includes a requirement that the fuel heating value will be obtained at least once per month, using the procedures in 40 CFR Part 75, Appendix D. Appendix D does require monthly sampling of the fuel heating value for natural gas, but the options for sampling fuel oil heat content are based on the frequency at which the facility receives deliveries of fuel oil or makes additions to the fuel oil tank. Tri-State requests that the language requiring monthly sampling in Appendix G of the permit be removed so that the frequency is established indirectly through the reference to Part 75, Appendix D. The Division agrees that the language does not appropriately establish the difference in sampling requirements for the two different fuel types, and therefore deleted "at least once per month" from the language. For clarification, the Division added a new sentence to the requirement referencing the applicable sections of Appendix D that establish fuel heat value sampling frequency.

It should be noted that in another recently drafted permit for a similar facility (Tri-State's Frank Knutson Station, which also includes two similarly-sized natural gas-fired turbines with fuel oil backup; Permit No. 03OPAD257; AIRS ID 0011349), the Division required the fuel oil heat value sampling to be as specified in 40 CFR Part 75 Appendix D, or at least once per calendar year in the event that no fuel deliveries or fuel tank additions occurred during that calendar year to ensure that at least one sample was obtained annually. The Frank Knutson Station operates for peaking purposes and includes lower emission limits, and it is conceivable that fuel oil deliveries may not occur during a calendar year. The Division did not include the same annual sampling requirement for the Limon Generating Station due to its higher anticipated levels of operation and fuel oil consumption/deliveries.

Tri-State also noted in the renewal application that the reference to "equation 2.1 of 40 CFR Part 60, Appendix A, Method 19" in the Fuel Heating Value language is no longer valid since Method 19 has been revised. Tri-State requests that the language "equation 2.1" be replaced with "Section 12.2." The Division concurs.

- Updated the list of Insignificant Activities in Appendix A: deleted the 300 gallon Potassium Hydroxide storage tank, changed the Sodium Hydroxide storage tank capacity from 330 gallons to 450 gallons, changed the Sodium Bisulfate storage tank

capacity from 300 gallons to 22 gallons, and added a second Pressurized CO₂ tank for fire protection.

Other Modifications

In addition to the source requested modifications, the Division has included changes to make the permit more consistent with recently issued permits, include comments made by EPA on other Operating Permits, as well as correct errors or omissions identified during inspections and/or discrepancies identified during review of this renewal.

The Division has made the following revisions, based on recent internal permit processing decisions and EPA comments to the Tri-State Limon Generating Station Operating Permit. These changes are as follows:

Page Following Cover Page

- It should be noted that the monitoring and compliance periods and report and certification due dates are shown as examples. The appropriate monitoring and compliance periods and report and certification due dates will be filled in after permit issuance and will be based on permit issuance date. Note that the source may request to keep the same monitoring and compliance periods and report and certification due dates as were provided in the original permit. However, it should be noted that with this option, depending on the permit issuance date, the first monitoring period and compliance period may be short (i.e. less than 6 months and less than 1 year).
- Modified the language concerning postmarked dates for report submittals to reflect the Division's current standard language.

Section I – General Activities and Summary

- Revised the language in Condition 1.4 include current conditions that are state-only enforceable.

Section II – Specific Permit Terms

- The permit allows that visible emissions observations are not required for any period where no distillate fuel oil is burned. Based on comments received for another facility, it should be noted that if distillate oil is only burned during non-daylight hours or for periods less than six minutes, this will create a situation where the turbine must be started again on fuel oil for the sole purpose of obtaining an opacity reading. Therefore, the Division has modified Conditions 1.12.5.1 and 1.12.5.2 to state that visible emission observations are not required during any annual period where no distillate fuel oil is burned, where distillate fuel is not burned for a period of at least six minutes, or when fuel oil is not burned during daylight hours.

- Condition 2.4 was also updated to show that excess emissions and monitor downtime reports are required on a semi-annual rather than a quarterly basis. Subpart GG was amended in 2006 to clarify that the quarterly frequency was incorrectly stated in the previous version of the rule, and that the actual requirement is semi-annually, except during ice fog events. Condition 2.4 has also been updated accordingly. **This change has since been removed – see discussion on Page 9.*

Section III – Acid Rain Provisions

- Added a requirement to Section 1 (directly under ADR and DR), specifying that changes to the DR and ADR shall be made according to 40 CFR Part 72 § 72.23.
- Revised the table to include calendar years corresponding to the relevant permit term for the renewal.
- Updated the reference to §72.84(a) in the footnotes to the tables in Section 2 to show the most recent version.
- Minor changes were made to the standard requirements, based on changes made to 40 CFR Part 72 § 72.9.

Section IV – Permit Shield

- Updated the Reg 3 Citation for the permit shield

Section V – General Permit Conditions

- Updated the general permit conditions to the current version (7/21/2009).

Appendices

- Updated Appendices B and C (Monitoring and Permit Deviation Reports and Compliance Certification Reports) to the newest versions (2/20/2007).
- EPA's mailing address was revised (Appendix D). Removed the Acid Rain addresses in Appendix D, since annual certification is no longer required and submittal of quarterly reports/certifications is done electronically.
- Cleared the list of modifications from Appendix F related to the previous issuance.

Modifications Following the Public Notice Period

The source submitted additional comments during the public notice period, received on January 15, 2010. The Division reviewed the comments and determined that the changes were not significant and therefore do not warrant re-noticing the draft permit. The modifications completed are:

- Updated the responsible official title and facility contact person on the page following the cover page. Updated the title of the designated representative and changed the alternate designated representative in the Acid Rain section (Section III).
- Corrected a typographical error in Section I, Condition 1.1 to change “back-up fuel sources” to “backup-fuel source.”
- Added a clarification to Appendix G to specify the use of Appendix A-7, method 19 (the previous language specified “Appendix A”).

March 2010 Update: Following the initial public notice period (beginning December 31, 2009) it was discovered that the notice had never been printed by the newspaper. At this time, the EPA 45-day review period had already begun. The Division started a second public notice period from March 18, 2010 – April 17, 2010. No comments were received during either of the public notice periods; therefore the Division determines that a second 45 day review by EPA is not warranted.

May 2010 Update: the Division has recently made determinations for other operating permits to require Subpart GG EERs quarterly despite the amendments to the rule. Therefore, the Limon permit will be issued with quarterly EER reporting requirements. Since this change reverts to a more frequent schedule that was already included in the previous operating permit, it is determined to be administrative in nature and will not require additional public notice or EPA review.